

Client's ref: P4982-001-0000 (US)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: N. HIROSE, :
et al : Art Unit: 1756
Appln. No.: 10/056,577 :
Examiner: Christopher
Filed: January 24, 2002 : D. Rodee
For: Toner for Forming Electro- :
Static Image :

Confirmation #5337

DECLARATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

S i r:

CERTIFICATE

I hereby certify that this correspondence is being EFS-Web or facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 16, 2007.

LUCAS & MERCANTI, LLP

BY:

Donald C. Lucas, Reg. No. 31,275

I, Hiroshi Yamazaki, hereby declare and say as follows:

1. I am one of the Inventors in this Application and have previously submitted Declarations in this case.
2. I received a Masters Degree in Applied Chemistry from Yokohama National University in March 1979. Since April of 1979, I have been employed by Konica

Corporation, the Assignee of the present Invention. During my employment at Konica, I have been engaged in research and development of electrophotographic materials.

3. I am aware that the present Invention has been rejected based on Nozawa (US 6,555,281) in view of Rimai (US 4,737,433). The Examiner has relied on Nozawa to teach the chemical composition of the resin claimed in the Application. In order to demonstrate the criticality of the limitation that the resin comprises 0.1 to 15 wt. % of monomers having an acidic group, tests have been performed and their results are reported in the attached Tables. These tests were performed by me or under my direct supervision and control.

4. I believe that Example 70 of Nozawa is the closest prior art to the present Invention, thus, the toner particles of Example 70 of Nozawa were prepared in accordance with the description of Examples 69-71 in Col. 44 of Nozawa except that the chemical composition of the resin is shown in the attached Table. Since Nozawa is silent concerning the type of pulverization

device and pneumatic classifier, I type mill IDS-2 was employed as the pulverizer (produced by Nippon Pneumatic Mfg. Co., Ltd.) and Mikroplex 132 MP was employed as the pneumatic classifier (produced by Yaskawa Electric Manufacturing Co., Ltd.). A coarsely crushed melt-kneaded product was finely pulverized using the I type mill IDS-2 pulverized under compressed air pressure at 6.0 kg/cm²G at a feed supply rate of 13 kg/hr. After pulverization, classification was performed using the Mikroplex 132 MP classifier under a rotation rate of 12,000 rpm and a guide vane angle of 7.8°. The prepared toner particles were labeled "Nozawa 2" in the attached Tables.

5. Four other toners, labeled Modified 1, 2, 3 and 4 in the attached Tables, were prepared in the same manner as Nozawa 2 except that the chemical composition of the resin was varied so as to produce a toner that had a resin with different amounts of monomers with acidic groups. The amount of the acid monomer is listed in the attached Tables. The chemical compositions of the resins were chosen so as to have similar softening points.

6. The toners were evaluated and the results of the evaluations are shown in the attached Tables. The ratio of toner particles having a diameter of 0.60-1.00 μm was measured using the analyzing apparatus FPIA-2000 described at page 11, lines 17-22 of the present invention. SF-1 and SF-2 were measured by observing 100 particles using an electron microscope with a 2000x magnification and analyzing the image as described at page 11, lines 3-11 of the present Invention. The size distribution N was measured using the COULTER MULTICIZER having the 100 μm aperture described in Col. 20 of Nozawa.
7. As shown in the Tables, all of the toners had identical particle size distribution and shape characteristics, thus, the only difference was the chemical composition of the resin.
8. Cyan toner samples were prepared in accordance with Example 39 of Nozawa, Column 42, lines 25-45 for all the toners. During the toner preparation process, the shape factor did not change.

9. In order to demonstrate the difference between the toners, the colored particles were used to make copies in the manner described in this Application on pages 46-49. The fog density and half tone unevenness were evaluated and are reported in the attached Tables.
10. As can be seen, the samples differed only in the percent of monomer with acid groups in the resin. However, this difference is significant when viewing the fog density and the half tone unevenness after 50,000 copies; and became even more pronounced after 100,000 copies. In fact, the fog of 0.009 for Nozawa 2 and Modified 4 is commercially unacceptable.
11. I find these results surprising and unexpected that such a change in the chemical composition of toner to result in such a dramatic difference in the fog density and half tone unevenness.

It is declared by undersigned that all statements made herein of undersigned's own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made

are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the U.S. Code; and that such willful false statements may jeopardize the validity of this Application or any patent issuing thereon.

Hiroshi Yamazaki

Hiroshi Yamazaki

Dated: This 14th day of May, 2007.

Attached: Three Tables

DCL/mr

Sample

Sample	D4 (μm)	N ($\square 4\mu\text{m}$) %	0.60-1.00 μm (%)	SF-1	SF-2	SF-1/SF-2
Nozawa 2	7.1	8.1	4.8	162	138	1.17
Modified 1	7.1	8.1	4.8	162	138	1.17
Modified 2	7.1	8.1	4.8	162	138	1.17
Modified 3	7.1	8.1	4.8	162	138	1.17
Modified 4	7.1	8.1	4.8	162	138	1.17

Sample	Monomer composition (*)	Fog			Halftone Unevenness		
		Initial	After 50,000	After 100,000	Initial	After 50,000	After 100,000
Nozawa 2	St/BA/MMA 85/15/0	0.001	0.004	0.009	A	B	C
Modified 1	St/BA/MMA 84.8/15/0.2	0.001	0.002	0.005	A	A	B
Modified 2	St/BA/MMA 80/15/5	0.001	0.002	0.004	A	A	B
Modified 3	St/BA/MMA 71/15/14	0.001	0.003	0.006	A	A	B
Modified 4	St/BA/MMA 69/15/16	0.001	0.004	0.009	A	B	C

(*) St: Styrene, BA: Butyl acrylate, MMA: Methyl methacrylate

Sample

Weight % of monomer having an acid
group in the resin

Nozawa 2	0
Modified 1	0.2
Modified 2	5
Modified 3	14
Modified 4	16